

## **NATIONAL MINERAL POLICY—CONSERVATION OF MINERAL RESOURCES AND NECESSITY FOR BENEFICIATION**

**T**HE mineral resources of a country are its non-replenishable assets. A well planned programme for their systematic and optimum utilisation is the basic requirement for its steady industrial growth and economy. Prior to the attainment of national independence to India, the policy of the then existing Government in regard to ores and minerals was to encourage private enterprise to explore and exploit mineral wealth according to their own right, without any interference from the Government except, in so far as safety and welfare of workers are concerned, through the medium of Indian Mines Act 1903 and 1923. As such most of the mineral exploitation was largely in the hands of foreign capital and Indian minerals were primarily meant for export and international trade as feeders to foreign industries. If this were continued for some more years most of the nation's mineral assets would have been depleted. But this policy was found too arbitrary, and harmful to cope with the situation of developing economy after independence to regulate the development of nation's mineral resources for conservation and proper utilisation resulting in rapid economic growth, employment potential and national security. This has been timely realised soon, and the national Government has codified the new policy in regard to the regulation and control of mines and minerals, by enunciating the first Industrial Policy Resolution of 1948, which was subsequently replaced by the second Industrial Policy Resolution of 1956, with a number of enactments and orders issued subsequently. According to this the proprietary rights of mineral vest with the Central Government, and all new industrial units for minerals in the First Schedule (A) of the Resolution will be developed exclusively by the State (Public Sector), which

included the development of coal and lignite, mineral oil (petroleum and natural gas), iron ore, manganese ore: chrome ore, gypsum, sulphur, gold, diamonds copper, lead, zinc, tin, molybdenum, wolfram and atomic energy minerals. Atomic energy minerals are those which are used for development and control of atomic energy, such as graphite, uranium minerals, thorium, radium, beryllium and lithium, deuterium, plutonium and neptunium minerals which contain the above metals as accessories such as uraniferous allanite, triplite, columbite, tantalite, pitchblende, samarskite, monazite and uranium-bearing tailings left over from ores after extraction of copper, gold, ilmenite, zircon, rutile or beryl. It permitted the expansion of the existing private units within the areas to be demarcated. All other minerals except the "minor minerals" and minerals of Schedule (A) given above are included in the second Schedule (B) and their exploration and exploitation are to be progressively operated by State (Public Sector). The private sector is left with the minor minerals and minerals excluded from the State operation and their industrial development as indicated in the third Schedule (C). At the same time the State Government may associate itself individually or in joint venture with this group of minerals also whenever felt necessary. The minerals included in the list of "minor minerals" are minerals of local importance which can be developed on small or cottage scale for benefit of local people such as building stone, marble, shingle, gravel, chalcedony, pebble, limeshell, kankar, limestone for limeburning, murram, brick earth, fuller's earth, bentonite, ordinary clay, ordinary sand used for non-industrial purposes, road metal, rehmatti, slate and shale.

The Mines and Minerals (Regulation and Development) Act of 1957 and the Mineral Concession Rules 1960, framed thereunder are the instruments through which the Government is implementing the provisions of the Industrial Policy Resolution regarding minerals. Accordingly the Central Government has entered the field of mineral exploitation as Public Sector undertakings of copper and lead (Hindustan Copper Ltd.—1967), Zinc (Hindustan Zinc Ltd., 1966), Manganese. (Manganese Ores (India) Ltd.—1962—a joint sector), Iron ores (National Mineral Development Corpn.—1958, Hindustan Steel Ltd.—1953), Gold (Bharat Gold Mines Ltd.), Coal (National Coal Development Corpn., Ltd.—1956), Fertilizers (Fertilizer Corporation of India—1961; Fertilizers & Chemicals (Travancore) Ltd.—1960 Joint Sector), Madras Fertilizers Ltd.—1966), Pyrites, Phosphates and Chemicals Ltd.; Aluminium (Bharat Aluminium Co. Ltd.—1965), etc.

The Government of India has recently classified certain strategic minerals of national importance as "Specified minerals", in the matter of granting prospecting licence and mining lease of which the prior sanction of the Central Government is essential. No State can work any such mineral departmentally without Centre's approval. The list of "Specified minerals" includes according to the Mines and Minerals (Regulation and Development) Act, 1957, apatite and phosphatic ores, beryl, chrome ore, coal and lignite, columbite, samarskite and other rare earth group minerals, copper, gold, gypsum, iron ore, lead, manganese ore, molybdenum, nickel ores, platinum and other precious metals and their ores, pitchblende and other uranium ores, precious stones, rutile, silver, sulphur and its ores, tin, tungsten ores, uraniferous allanite, monazite and other thorium minerals, uranium bearing tailings left over from ores after extraction of copper and gold, ilmenite and other titanium ores, vanadium ores, zinc and zircon.

The Mineral Conservation and Development Rules, 1958, framed under Section 18 of the Mines and Minerals (Regulation and Development) Act, 1957, become effective from 1st June 1958, in supersession to the Mineral Conservation and Development Rules, 1955. These rules do not apply to petroleum and natural gas, coal, minor minerals and any minerals described as prescribed substance for the purposes of the Atomic Energy Act, 1962 (Act No. of 1962).

According to these rules all private mine owners are required to follow the directions issued from time to time by the Controller of Mines, IBM for conservation and systematic development of minerals.

### **Import and Export Policies**

According to the Imports and Exports (Control) Act, 1947, which has been extended and amended from time to time by the Government of India, imports or exports of minerals, ores, concentrates, metals and alloys are guided and applicable to the whole of India. The Minerals and Metals Trading Corporation Ltd., (MMTC) owned by Govt. of India looks after the exports and imports of ores, minerals, metals, alloys etc. with the collaboration of the railways, the port trust, and public and private sector mining entrepreneurs.

The import policy of Govt. of India pertaining to minerals, ores, metals and alloys has been restrictive owing to foreign exchange difficulties, and only those minerals, ores, metals and alloys of standard qualities which are not available in the country in sufficient quantities, vitally required for industries, are permitted to be imported.

In the same way the export policy has also been restrictive and only those minerals, ores, metals and alloys which are available in the country in excess of indigenous demands are allowed to be exported. These are subject to revision from time to time.

The exploration activities in general have been taken up by Geological Survey of India, the different Directorates of Mining and Geology in the various States and the Mineral Exploration Corporation Ltd.

Most of the exploitation now-a-days is being done by the Public Sector undertakings in case of minerals of the first schedule (a) and the second schedule (b) as already stated earlier, even though some captive mines have been allowed to continue in the hands of Private Sector.

With all the above rigid State control and restrictions to meet the increasing demand in quantity of ores and minerals and the rigid



quality specifications both of physical and chemical nature for meeting the expanding domestic needs as well as the export market, mechanised mining is adopted particularly in the fields of iron ore etc. in place of selective hand-mining to achieve higher ore production. This has consequently created several problems which need careful studies. Mechanized mining can not distinguish between poor and good grade of the ore, with the result that the run-of-mine ore will be of poorer quality and higher in gangue than the selected hand-mined ore. Further during mining of lump ores and powdery and soft ores a sizeable quantity of ore fines result. More fines are generated due to fragmentation during mining (in zones from where lump ores are obtained) and also due to crushing and sizing.

These fines, which are being accumulated at the mine sites into enormous reserves, cannot be left out as such as they would hamper the development programmes of the mines and the ore production in future years firstly as a huge waste of natural resource and would also increase the mining and production cost if they are not properly and timely utilised by adopting suitable beneficiation methods such as agglomeration techniques as pelletising and sintering which can be adopted to fines of iron ores, chrome ores, manganese ores, etc.

Although mining activity in India is practised vigorously since the last nearly 80 to 100 years in various fields like iron ores, manganese ore, chromite etc. no commensurate effort to conserve the high grade ores and utilize low grade ores have seriously been made by most of the private mining lease holders and to some extent even by the public sector undertakings. This is due to the natural tendency of aspiring for quick returns with minimum effort and expense particularly with the small mine owners to exploit the rich high deposits by adopting haphazardly non-systematic mining methods leaving huge low grade deposits behind untouched and with no account. The Government of India also could not do much to adopt strict measures in this regard. As much development has been achieved in the field of research on beneficiation of low grade ores and minerals in the country during the last 25 years or more in the various research organisations like the N.M.L., B.A.R.C., I.B.M., Regional Research Laboratories of C.S.I.R. etc., situated in the different States in

the country, it is high time that a techno-economic study of this aspect of the ores must be started and strict measures enforced to mine both the high grade and low grade ores as well, and adopting beneficiation methods for treating the low grade ores. It is suggested that Government should provide common custom mills/concentrators to be useful for the small mine owners who can treat their low grade ores economically.

All the non-ferrous base-metal deposits and the strategic minerals deposits in the country are of very low grade variety and need concentration by adopting suitable beneficiation methods to make them suitable as feed raw material products for further metallurgical processing of the ores. Thus all the copper ores, lead and zinc ores, nickel ores, molybdenum, graphite and tungsten ores present in India are of low grade in their natural state of occurrence and have to be subjected to beneficiation treatment to make them useful for their further usage in metallurgical industry.

A good number of non-metallic and refractory ores and minerals and fertilizer mineral deposits in the country are also of low-grade in nature and are to be up-graded to the desired limits by adopting suitable beneficiation methods to make them useful as raw material in their various respective mineral based industries.

Summing up, the mineral exploitation before independence was largely in the hands of foreign capital, and most of the Indian minerals were primarily meant for international trade and industry. Immediately after independence this suicidal policy of bulk export of minerals has been virtually stopped by the enunciation of the National Mineral Policy in 1947 by the Government of India, in the first Industrial Policy Resolution of 1948 which was subsequently replaced by the second Industrial Policy Resolution of 1956. According to this all the mineral exploitation in the country is now mostly in the public sector and some in the private sector and partly in joint public sectors with foreign capital participation.

This development of mineral resources, their assessment and economic exploitation for the growth of mineral based industries is in progress phase-wise through the successive five year plans in the country. Except in the case of iron ore

and mica the identified resources are of low to medium grade quality which need and demand ore beneficiation as a necessity to make them suitable for further metallurgical processing. Thus some ore-dressing plants are effectively up-grading limestone, graphite, copper ore, gold ore etc. in the country but exploitation of low grade deposits still remains by and large neglected. Beneficiation of low grade ores plays a vital part in the conservation and utilisation of

the mineral resources. Utilisation of ore fines, which are being accumulated in very huge tonnages at the mine sites during mechanised mining operations and subsequent crushing and screening operations, can also be done by adopting the beneficiation process of agglomeration like pelletisation and sintering and thus conserve the nation's mineral wealth and at the same time solving of their disposal from the mining and plant sites in the best way possible.